

CLAIMS

1. A display device, comprising:
 - a display drive having a plurality of scanning lines and a plurality of data lines formed in a grating form corresponding to dots as minimum units of display and active elements provided corresponding to intersections, the display drive performs display control using a liquid crystal by driving said scanning lines and said data lines;
 - 5 a scanning line driver that selects and drives said scanning lines, the scanning line driver being allocated corresponding to a length in a column direction of said display drive;
 - 10 a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of said display drive, the memory being allocated corresponding to the length in a row direction of said display drive;
 - 15 a column decoder allocated corresponding to the length in the row direction of said display drive, the column decoder selects said memory cells for storing an input image signal;
 - 20 a column selection switch section allocated corresponding to the length in the row direction of said display drive, to switch on the basis of a selection by said column decoder and the image signal and storing the image signal to said memory cells selected by said column decoder; and
 - 25 a data line driver allocated corresponding to the length in the row direction of said display drive, the data line driver drives said data lines on the basis of the image signal stored in said memory, the data line driver further being integrated on a semiconductor or an insulating substrate and integrally formed therewith.

2. A display device, comprising:

a display drive having a plurality of scanning lines and a plurality of data lines formed in a grating form corresponding to dots as minimum units of display and active elements provided corresponding to intersections, the display drive 5 performs display control using a liquid crystal by driving said scanning lines and said data lines;

a scanning line driver that selects and drives said scanning lines, the scanning line driver being allocated to have a length in a column direction equal to or smaller than a length in a row direction of said display drive;

10 a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of said display drive, the memory being allocated to have a length in a row direction thereof equal to or smaller than the length in the row direction of said display drive;

a column decoder allocated to have a length in a row direction equal 15 to or smaller than the length in the row direction of said display drive, the column decoder selects said memory cells for storing an input image signal;

a column selection switch section allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, to switch on the basis of a selection by said column decoder and the image signal and 20 storing the image signal to said memory cells selected by said column decoder; and

a data line driver allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive section, the data line driver drives said data lines on the basis of the image signal stored in said memory, the data line driver further being integrated on a semiconductor or an 25 insulating substrate and integrally formed therewith.

3. A display device, comprising:

a display drive having a plurality of scanning lines and a plurality of data lines formed in a grating form corresponding to dots as minimum units of display and active elements provided corresponding to intersections, the display device emits an organic EL elements connected to said active elements by driving said scanning lines and said data lines to perform display control;

a scanning line driver that selects and drives said scanning lines, the scanning line driver being allocated corresponding to a length in a column direction of said display drive;

10 a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of said display drive, the memory being allocated corresponding to the length in the row direction of said display drive;

15 a column decoder allocated corresponding to the length in the row direction of said display drive, the column decoder selects said memory cells for storing an input image signal;

a column selection switch section allocated corresponding to the length in the row direction of said display drive to switch on the basis of a selection by said column decoder and the image signal and storing the image signal to said memory cells selected by said column decoder; and

a data line driver allocated corresponding to the length in the row direction of said display drive section, the data line driver drives said data lines on the basis of the image signal stored in said memory, the data line driver further being integrated on a semiconductor or an insulating substrate and integrally formed therewith.

4. A display device, comprising:

a display drive having a plurality of scanning lines and a plurality of data lines formed in a grating form corresponding to dots as minimum units of display and active elements provided corresponding to intersections, to emit an organic EL element connected to said active elements by driving said scanning lines and said data lines to perform display control;

5 a scanning line driver that selects and drives said scanning lines, the scanning line driver being allocated to have a length in a column direction equal to or smaller than a length in the column direction of said display drive;

10 a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of said display drive, the memory being allocated to have a length in a row direction thereof equal to or smaller than the length in the row direction of said display drive;

15 a column decoder allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, the column decoder selects said memory cells for storing an input image signal;

20 a column selection switch section allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, to switch on the basis of a selection by said column decoder and the image signal and storing the image signal to said memory cells selected by said column decoder; and

25 a data line driver allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, the data line driver drives said data lines on the basis of the image signal stored in said memory, the data line driver further being integrated on a semiconductor or an insulating substrate and integrally formed therewith.

5. A display device, comprising:

a display drive having a plurality of scanning lines and a plurality of bit lines, and a liquid crystal display that is controlled by driving the corresponding scanning lines and bit lines and provided on a dot-by-dot basis as minimum units of display control, and formed in a matrix form;

5 a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of the display drive, the memory being allocated corresponding to the length in the row direction of said display drive;

10 a column decoder allocated corresponding to the length in the row direction of said display drive, the column decoder selects the memory cells for storing an input image signal; and

15 a column selection switch section allocated corresponding to the length in the row direction of said display drive, to switch on the basis of a selection by said column decoder and the image signal and storing the image signal to said memory cell selected by said column decoder, the column decoder being integrated on a semiconductor or insulating substrate and integrally formed therewith.

6. A display device, comprising:

a display drive having a plurality of scanning lines and a plurality of bit lines, and a liquid crystal display that is controlled by driving the corresponding scanning lines and bit lines and provided on a dot-by-dot basis as minimum units of display control, and formed in a matrix form;

20 a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of said display drive, the memory being allocated to have a length in a row direction

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thereof equal to or smaller than the length in the row direction of said display drive, and each of the memory cells being connected to each of the bit lines;

a column decoder allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, the column decoder selects said memory cells for storing an input image signal; and

a column selection switch section allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, to switch on the basis of a selection by said column decoder and the image signal and storing the image signal to said memory cells selected by said column decoder, the column selection switch section being integrated on a semiconductor or an insulating substrate and integrally formed therewith.

7. A display device, comprising:

a display drive having a plurality of scanning lines and a plurality of bit lines, and organic EL elements to be controlled in luminescent display by driving the corresponding scanning lines and bit lines and provided on a dot-by-dot basis as minimum units of control in display, and formed in a matrix form;

a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of said display drive, the memory being allocated corresponding to the length in the row direction of said display drive, and each of the memory cells being connected to each of the bit lines;

a column decoder allocated corresponding to the length in the row direction of said display drive, the column decoder selects said memory cells storing an input image signal; and

a column selection switch section allocated corresponding to the length in the row direction of said display drive, to switch on the basis of a selection by said column decoder and the image signal and storing the image signal to said memory cell selected by said column decoder, the column selection switch section being integrated on a semiconductor or an insulating substrate and integrally formed therewith.

8. A display device, comprising:

a display drive having a plurality of scanning lines and a plurality of bit lines, and organic EL elements to be controlled in luminescent display by driving the corresponding scanning lines and bit lines and provided on a dot-by-dot basis as minimum units of control in display, and formed in a matrix form;

a memory having a plurality of memory cells that are capable of storing an image signal for performing display control of dots in at least one row of said display drive, the memory being allocated to have a length in a row direction thereof equal to or smaller than the length in the row direction of said display drive and each of the memory cells being connected each of the bit lines;

a column decoder allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, the column decoder selects said memory cells for storing an input image signal; and

a column selection switch section allocated to have a length in a row direction equal to or smaller than the length in the row direction of said display drive, to switch on the basis of a selection by said column decoder and the image signal and storing the image signal to said memory cells selected by said column decoder, the column selection switch section integrated on a semiconductor or an insulating substrate and integrally formed therewith.

9. A display device as claimed in claim 1, wherein the number of said memory cells, which are allocated corresponding to the length in the row direction of said display drive and capable of storing the image signal for display control of the dots on one row of said display drive, is structured redundantly.

5 10. A display device as claimed in claim 1, wherein said memory connects said memory cells in the number capable of storing an image signal for display control of the one-row dots to each of word lines in the number equal to the number of said scanning lines and is structured with a memory array corresponding to dot arrangement of said display drive, and

10 10 a word line driver that selects and drives said word lines are further integrated on and integrally formed with said substrate.

11. A display device as claimed in claim 10, wherein, on the basis of an address signal representative of a display position and a storage position, said scanning line driver selects said scanning lines and said word line driver selects said word lines.

12. A display device as claimed in claim 11, wherein the same address signal is inputted to said scanning line driver and said word line driver.

13. A display device as claimed in claim 11, wherein independent address signals are inputted to said scanning line driver and said word line driver.

20 14. A display device as claimed in claim 11, wherein said scanning line driver operates to select and drive said scanning lines on the basis of the address signal only when a scanning line driver control signal is inputted, and said word line driver operates to select and drive said word lines on the basis of the address signal only when a word line driver control signal is inputted.

15. A display device as claimed in claim 11, said column decoder section selecting the memory cell to store an inputted image signal on the basis of the address signal.

16. A display device as claimed in claim 15, wherein one pixel
5 comprises three dots provided for developing and displaying red, blue and green as light source colors, the image signal is inputted on the basis of a unit of one-pixel , and said column decoder selects the memory cell in an amount of one pixel.

17. A display device as claimed in claim 15, wherein one pixel
comprises three dots provided for developing and displaying red, blue and green as
10 light source colors, the image signal is inputted on the basis of a unit of a plurality of pixels , and said column decoder selects the memory cell in an amount of a plurality of pixels.

18. A display device as claimed in claim 1, wherein an input
interconnection for the image signal to be stored in said memory cell and said column
15 selection switch section are formed on a side opposite to said display drive
sandwiching said memory therebetween.

19. A display device as claimed in claim 1, wherein said memory is
allocated with the memory cell corresponding to the length in the row direction of said
display drive and formed in a multi-stage structure.

20. A display device as claimed in claim 10, said word lines being
provided in the number of integer times the number of the scanning lines, and said
memory being structured by a memory array connecting , by grouping, the memory
cells in the number capable of storing the image signal for display control of the one-
row dots of said display drive to the word lines in the number of the integer times.

21. A display device as claimed in claim 1, wherein said memory is structured by a memory array having the memory cells that are in the number capable of storing the image signal for display control of a plurality of rows of the dots of said display drive and allocated corresponding to the length in the row direction of said display drive.

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22. A display device as claimed in claim 1, wherein said memory is structured by a memory array having the memory cells that are in the number capable of storing the image signal for display control of a plurality of rows of the dots of said display drive and allocated to have a length in the row direction equal to or smaller than the length in the row direction of said display drive.

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23. A display device as claimed in claim 22, further comprising:

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 a timing controller that controls a timing of transmitting the address signal, and

 a memory controller that controls the transmitting of the image signal, the memory controller being integrated on a semiconductor or an insulating substrate and integrally formed therewith.

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24. A display device as claimed in claim 1, wherein a D/A converter is provided between said display drive and said memory cell that converts the image signal comprising a digital signal stored in the memory cell into an analog signal, followed by supplying to said display drive.

25. A display device as claimed in claim 1, wherein said display drive and said memory are directly coupled to supply the image signal comprising a digital signal stored in said memory to said display drive.

26. A display device as claimed in claim 25, wherein said display drive performs digital drive through area tonal level, time-division tonal level or a combination thereof.